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EXAMINER	
PEREZ DAPLE, AARON C	
ART UNIT	**PAPER NUMBER**
2154	

DATE MAILED: 01/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application N .	Applicant(s)	
	09/716,892	CHANDHOKE, SUNDEEP	
	Examiner	Art Unit	
	Aaron C Perez-Daple	2154	

-- The MAILING DATE of this communication appears on the cover sheet with the c rrespondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 August 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,5-17,19,20 and 23-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,5-10,12-17,19,20 and 23-26* is/are rejected.

7)☒ Claim(s) *11* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This Action is in response to Remarks filed 8/9/04, which have been fully considered.

2. Claims 1, 2, 5-17, 19, 20 and 23-26 are presented for examination.

3. This Action is Final.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. **Claims 1, 2, 5, 7, 8, 12-14, 17, 19, 20 and 23-26** are rejected under 35 U.S.C. 102(e) as being anticipated by Gudaz et al (US 6,510,353) (hereinafter Gudaz).

As for claim 1, Gudaz discloses a method for performing user controllable autotuning of a PID controller, the method comprising:

displaying at least one graphical user input (GUI) element for specifying a desired performance characteristic of a PID controller autotuning algorithm (Fig. 7);

receiving user input to the at least one GUI element indicating the desired performance characteristic of a PID controller autotuning algorithm (cols. 3-4, "A simulation procedure...the selected point.");

configuring the PID controller autotuning algorithm in response to the user input indicating the desired performance characteristic, wherein said configuring produces a

configured PID controller autotuning algorithm (cols. 3-4, "A simulation procedure...the selected point."); and

executing the configured PID controller autotuning algorithm to tune the PID controller (col. 4, "According to one aspect...the selected point.");

wherein the user input indicating the desired performance characteristic indicates a desired operation of the PID controller after execution of the autotuning algorithm, and wherein the desired operation includes one or more of stiffness and response time (col. 22, line 55 - col. 23, line 43, "Next, a user may...the selected point.").

6. As for claim 2, Gudaz discloses the method of claim 1,

wherein the PID controller autotuning algorithm executes according to the desired performance characteristic indicated by the user (cols. 3-4, "A simulation procedure...the selected point.").

7. As for claim 5, Gudaz discloses the method of claim 1, further comprising:

displaying a graphical user interface on a display device, wherein the graphical user interface includes one or more user input controls which are operable to receive the user input indicating the desired performance characteristic of the PID controller autotuning algorithm (col. 22, "Referring again to Fig. 8...other desired manner.").

8. As for claim 7, Gudaz discloses the method of claim 5,

wherein the one or more input controls comprise one or more data fields; wherein the one or more data fields are operable to receive respective parameter values indicating the desired performance characteristic of the PID controller autotuning algorithm (col. 24, "While Fig. 8 has...via a keyboard, etc."; Fig. 7).

9. As for claim 8, Gudaz discloses the method of claim 1,

wherein the user input comprises one or more parameter values indicating the desired performance characteristic of the PID controller autotuning algorithm (cols. 22-23, "Next, a user may...other pattern as desired."); and

wherein said configuring the PID controller autotuning algorithm comprises applying the one or more parameter values to parameters of the PID controller autotuning algorithm (cols. 22-23, "Next, a user may...other pattern as desired.").

10. As for claim 12, Gudaz discloses a computer system for performing user controllable autotuning of a PID controller, the computer system comprising:

a processor (102, Fig. 6; col. 19, "Referring now to Fig. 6...desired robustness qualities.")

a memory medium coupled to the processor (102, Fig. 6; col. 19, "Referring now to Fig. 6...desired robustness qualities."), wherein the memory medium stores:

a PID controller autotuning algorithm (col. 19, "Referring now to Fig. 6...desired robustness qualities."); and

a software program operable to configure the PID controller autotuning algorithm in response to user input (100, Fig. 6; col. 19, "Referring now to Fig. 6...desired robustness qualities.");

a display device, coupled to the processor and the memory medium, wherein the software program is executable to display at least one graphical user interface (GUI) element for specifying a desired performance characteristic of a PID controller autotuning algorithm on

the display device (col. 19, line 61 - col. 20, line 38, "The routine 100...parameters to use."; Fig. 7); and

an input device which is operable to receive user input to control the at least one GUI element, thereby indicating the desired characteristic of the PID controller autotuning algorithm (col. 24, "While Fig. 8 has...via a keyboard, etc.");

wherein the software program is operable to configure the PID controller autotuning algorithm in response to the user input indicating the desired characteristic, wherein said configuring produces a configured PID controller autotuning algorithm (col. 19, "Referring now to Fig. 6...desired robustness qualities.");

wherein the processor is operable to execute the configured PID controller autotuning algorithm to tune the PID controller (col. 19, "Referring now to Fig. 6...desired robustness qualities."); and

wherein the user input indicating the desired performance characteristic indicates a desired operation of the PID controller after execution of the autotuning algorithm, and wherein the desired operation includes one or more of stiffness and response time (col. 22, line 55 - col. 23, line 43, "Next, a user may...the selected point).").

11. As for claim 13, Gudaz discloses the computer system of claim 12, further comprising:

a display device coupled to the processor (103, Fig. 6), wherein the display device is operable to display a user interface which is operable to receive the user input indicating a desired performance characteristic of a PID controller autotuning algorithm (col. 22, "Referring again to Fig. 8...other desired manner.").

12. As for claim 14, Gudaz discloses the computer system of claim 13,

wherein the user interface comprises a graphical user interface (Fig. 6), wherein the graphical user interface includes one or more user input controls which are operable to receive the user input indicating the desired performance characteristic of the PID controller autotuning algorithm (col. 22, "Referring again to Fig. 8...other desired manner.").

13. As for claim 17, Gudaz discloses the computer system of claim 12,

wherein the PID controller autotuning algorithm is executable according to the desired performance characteristic indicated by the user (col. 19, "Referring now to Fig. 6...desired robustness qualities.").

14. As for claim 19, Gudaz discloses a memory medium comprising program instructions, wherein the program instructions are computer-executable to perform:

displaying at least one graphical user input (GUI) element for specifying a desired performance characteristic of a PID controller autotuning algorithm (col. 19, line 61 - col. 20, line 38, "The routine 100...parameters to use."; Fig. 7);

receiving user input indicating the desired performance characteristic of a PID controller autotuning algorithm (col. 5, "According to a still further...with the selected point."; col. 19, "Referring now to Fig. 6...desired robustness qualities.");

configuring the PID controller autotuning algorithm in response to the user input indicating the desired performance characteristic, wherein said configuring produces a configured PID controller autotuning algorithm (col. 5, "According to a still further...with the selected point."; col. 19, "Referring now to Fig. 6...desired robustness qualities.");

executing the configured PID controller autotuning algorithm to tune the PID controller (col. 5, "According to a still further...with the selected point."; col. 19, "Referring now to Fig. 6...desired robustness qualities.");

wherein the user input indicating the desired performance characteristic indicates a desired operation of the PID controller after execution of the autotuning algorithm, and wherein the desired operation includes one or more of stiffness and response time (col. 22, line 55 - col. 23, line 43, "Next, a user may...the selected point).").

15. As for claim 20, Gudaz discloses the memory medium of claim 19,

wherein the PID controller autotuning algorithm executes according to the desired performance characteristic indicated by the user (col. 5, "According to a still further...with the selected point.").

16. As for claim 23, Gudaz discloses the method of claim 19, further comprising:

displaying a graphical user interface on a display device, wherein the graphical user interface includes one or more user input controls which are operable to receive the user input indicating the desired performance characteristic of the PID controller autotuning algorithm (cols. 5-6, "Referring now to Fig. 1...from one of the PCs 14.").

17. As for claim 24, Gudaz discloses the method of claim 23,

wherein the user input comprises one or more parameter values indicating the desired performance characteristic of the PID controller autotuning algorithm (cols. 22-23, "Next, a user may...other pattern as desired."); and

wherein said configuring the PID controller autotuning algorithm comprises applying the one or more parameter values to parameters of the PID controller autotuning algorithm (cols. 22-23, "Next, a user may...other pattern as desired.").

18. As for claim 25, Gudaz discloses a graphical user interface displayed on a display device, therein the graphical user interface includes:

one or more user input controls displayed in the graphical user interface which are operable to receive user input indicating a desired performance characteristic of a PID controller autotuning algorithm (Fig. 6; col. 22, "Referring again to Fig. 8...other desired manner.");

wherein the user input indicating the desired performance characteristic of the PID controller autotuning algorithm is operable to be used in configuring the PID controller autotuning algorithm (col. 5, "According to a still further...with the selected point." ; col. 22, "Referring again to Fig. 8...other desired manner."), wherein the user input indicating the desired performance characteristic indicates a desired operation of the PID controller after execution of the autotuning algorithm, and wherein the desired operation includes one or more of stiffness and response time (col. 22, line 55 - col. 23, line 43, "Next, a user may...the selected point).").

19. As for claim 26, Gudaz discloses a method for performing user controllable autotuning of a PID controller, the method comprising:

displaying at least one graphical user input (GUI) element for specifying a desired qualitative performance characteristic of a PID controller autotuning algorithm (Fig. 7);

receiving user input to the at least one GUI element indicating the desired qualitative performance characteristic of a PID controller autotuning algorithm (cols. 3-4, "A simulation procedure...the selected point.");

configuring the PID controller autotuning algorithm in response to the user input indicating the desired qualitative performance characteristic, wherein said configuring produces a configured PID controller autotuning algorithm (cols. 3-4, "A simulation procedure...the selected point."); and

executing the configured PID controller autotuning algorithm to tune the PID controller (col. 4, "According to one aspect...the selected point.");

wherein the user input indicating the desired qualitative performance characteristic indicates a desired operation of the PID controller after execution of the autotuning algorithm, and wherein the desired operation includes one or more of stiffness and response time (col. 22, line 55 - col. 23, line 43, "Next, a user may...the selected point.").

Claim Rejections - 35 USC § 103

20. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

21. **Claims 6 and 15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Gudaz in view of Kennedy et al (US 5,832,532). Although obvious to one or ordinary skill in the art, Gudaz does not specifically disclose the use of a slider control as one of the input controls. However, Gudaz does disclose the use of numeric cells (Fig. 6; col. 24, "While Fig. 8 has...via a keyboard, etc.") for setting and displaying parameter values. Kennedy discloses that a slider control can be used instead of (or in addition to) a cell containing a numerical value in order to allow the user to graphically adjust the parameter value over a range of possible values (col. 11, "Controls are individual display...the mouse on the box.").

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the user interface of Gudaz by using a slider control in order to graphically adjust the PID controller autotuning characteristics or parameters, as taught by Kennedy.

22. **Claims 9 and 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over Gudaz in view of in view of Molnar et al (US 5,734,597) (hereinafter Molnar). Although obvious to one or ordinary skill in the art, Gudaz does not specifically disclose displaying a command line interface on a display device. However, Molnar discloses that a command line interface may be substituted for a graphical user interface, or vice-versa (col. 1 "As users of

computers...and Microsoft Windows."), as both can be used to perform equivalent functions (such as setting parameters or characteristics).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute a command line interface for the graphics display interface disclosed by Gudaz, wherein the command line interface is operable to receive the user input indicating the desired characteristic of the PID controller autotuning algorithm, in order to provide an alternate interface method for setting the PID controller autotuning characteristics.

23. **Claim 10** is rejected under 35 U.S.C. 103(a) as being obvious over Gudaz. Gudaz discloses that a modified Ziegler-Nichols method may be used in tuning a PID controller (col. 10, "Likewise, the tuning controller...Ziegler-Nichols tuning, to name a few."). Furthermore, the Office notes that both the concept and advantages of using a modified Ziegler-Nichols method are well-known and expected in the art.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use an autotuning algorithm comprising modified Ziegler-Nichols equations, which are well-known in the art, for the purpose of tuning the controller of Gudaz.

Allowable Subject Matter

24. **Claim 11** is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

25. Applicant's arguments filed 8/9/04 with respect to claim 11, found on page 11 of the Remarks, are found persuasive. Accordingly, claim 11 has been objected to as depending on a rejected base claim.

26. Applicant's arguments filed 8/9/04 with respect to claims 1, 2, 5-10, 12-17, 19, 20 and 23-26 have been fully considered but they are not persuasive.

27. On pages 9 and 10 of the Remarks, Applicant asserts that Gudaz fails to teach or suggest "displaying at least one graphical user input (GUI) element for specifying a desired performance characteristic of a PID controller" as recited in claim 1. The Examiner respectfully disagrees. More specifically, Applicant cites Gudaz, col. 26, lines 14-21, which describe an example in which the derivative weighting factor has been set to a constant value. The Examiner finds that setting the derivative weighting factor to a constant does not preclude that the constant value is set by a user. In fact, Gudaz clearly anticipates precisely that the derivative weighting factor is set by a user in col. 25, lines 15-20:

> The range of the integral and derivative weighting factors to be used in the robustness map may be determined in any desired manner. For example, these ranges may be set or predetermined, ***may be input by the user*** or may be calculated based on the structure of the PID controller and the process characteristics. (emphasis added)

In the instant example, the derivative weighting factor would be set to a constant by the user rather than defined within a given range. Moreover, the Examiner interprets that defining a range for the weighting factor is itself sufficient to comprise the recited limitation of "specifying a desired performance characteristic." The Examiner further maintains his previous interpretation that selection of a robustness point is a method of "specifying a

desired performance characteristic" through a GUI element, because the points on the robustness map correspond directly to performance characteristics of the controller. In summary, Gudaz clearly anticipates multiple methods of displaying at least one graphical user input (GUI) element for specifying a desired performance characteristic of a PID controller, including by specifying a point on a robustness plot and by entering the desired characteristic into a text box (see top right of Fig. 7).

On pages 10-11, the Applicant attempts to create a somewhat false distinction between "performance characteristics" and "robustness properties." Since both sets of parameters ultimately must influence the gains of the controller, which are the only truly tunable parameters in the system, and since changing the robustness of a controller will inevitably affect the performance, the Examiner reasonably interprets that robustness properties and performance characteristics are equivalent.

On the top of page 12, Applicant asserts that Gudaz fails to teach or suggest "a desired qualitative performance characteristic" as recited in claim 26. This term has not been explicitly defined by the specification. Therefore, the Examiner reasonably interprets that a "qualitative performance characteristic" is equivalent to a performance characteristic or a robustness property. Even if Applicant can support the implied definition from Applicant's Remarks, the Examiner finds that Gudaz would still properly anticipate this limitation by teaching setting a range of a performance characteristic.

For all the reasons above, claims 1, 2, 5-10, 12-17, 19, 20 and 23-26 have been properly rejected under 35 USC 102(e) as anticipated by Gudaz.

Claims 6, 15, 9 and 16 are properly rejected under 35 USC 103 (a) for the same reasons cited above.

As for claim 10, as presented in the previous rejection mailed 5/6/04, the parameter d is equivalent to the derivative weighting factor of Gudaz. Therefore, claim 10 is properly anticipated under 35 USC 103 (a).

Conclusion

28. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

29. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aaron C Perez-Daple whose telephone number is (571) 272-3974. The examiner can normally be reached on 9am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Follansbee can be reached on (571) 272-3964. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

12/30/04

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